REMARKS

Reconsideration of this application is respectfully requested in light of the above amendments and following remarks. Claims 1 – 7 and 12 – 18 remain in the application and claims 8 – 11 and 19 – 22 have been cancelled. Applicant has renumbered the claims further to the office action requirement.

I. Claims 1-5, 8, 12-16 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sroka (US '748) or Atokawa et al. (US `620) in view of Liang et al. (US '883) and Kosugi et al. (EP '424). Applicant has amended claims 1 and 12 as follows:

1. (Currently Amended) A voltage-controlled tunable filter, comprising:

a plurality of coaxial combline resonators;

at least one of said plurality of coaxial combline resonators includes and at least one metallized through-hole;

an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

at least one voltage tunable dielectric varactor associated with said plurality of coaxial combline resonators; and

an iris with an aperture connecting said plurality of coaxial combline resonators.

12. (Currently Amended) A method of using voltage to control a tunable filter, comprising the steps of:

providing a plurality of coaxial combline resonators;

said plurality of coaxial combline resonators include at least one metallized through-hole and an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

varying the capacitance of a capacitor by using at least one voltage tunable dielectric capacitor associated with ~~said~~ at least one coaxial combline resonator of said plurality of coaxial combline resonators; and

connecting said plurality of coaxial combline resonators with an iris.

Applicant submits that none of the cited art includes, teaches or suggests, alone or in combination, at least the element "at least one voltage tunable dielectric varactor associated with said plurality of coaxial combline resonators" and therefore Applicant believes this rejection has been traversed.

II. Claims 6, 7, 9-11, 17, 18, and 20-22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sroka (US 748) or Atokawa et al. (US `620) in view of Liang et al. (US `883) and Kosugi et al. (EP `424) as applied to claims 1 and 12 above, and further in view of Liang et al. (US `883).

The office action took the position that the modified device of Sroka or Atokawa et al. does not show the tunable varactor can be made of low dielectric constant substrate (e.g., tunable dielectric varactors) or MEM tunable capacitors; but that such tunable varactors are well known in the art and that Liang et al. discloses a tunable filter having tunable dielectric varactors (figs. 8 and 9) or MEM tunable capacitors.

Applicant respectfully submits that that the Examiner cannot satisfy the basic requirements of a prima facie case of obviousness by combining Sroka or Atokawa et al and Liang et al. to reject pending independent Claims 1 and 12 and the remaining associated dependent claims. For the Examiner to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the references. Although the office action stated that it would have been obvious to one of ordinary skill in the art to use tunable dielectric capacitors or MEM tunable capacitors

as the tunable varactors in the modified device of Sroka or Atokawa et al. since both tunable capacitors and varactors are functionally equivalent and also for lower loss and higher power-handling as taught by Liang et al. (col. 10, lines 20-35). However, the performance parameters and characteristics of the voltage tunable dielectric varactors and the way in which they are integrated into the electronically tunable block filter of the present invention required numerous design considerations and much trial and error went into the incorporation of voltage tunable dielectric varactors into the present invention. Indeed, Liang as an employee of the assignee of the present application and cited art required much assistance in order that the assignee be able to design and develop the present invention. Further, it required much engineering talent to enable the range of the Q factor of the tunable dielectric capacitor to be between 50, for very high tuning material, and 300 or higher, for low tuning material. It also decreases with increasing the frequency, but even at higher frequencies say 30 GHz can take values as high as 100. A wide range of capacitance of the tunable dielectric capacitors is available, from 0.1 pF to several pF. This enables significant tuning at the level never even contemplated by the inventors of the cited. If persuasive, Applicant can provide an affidavit from Liang stating the difficulties in deriving the present invention in its claimed form and the non-obviousness in using the varactors of his invention (the cited art) in the electronically tunable block filter of the present application.

For the reason set for above, Applicant further submits that there is no reasonable expectation of success of combing the cited art.

III. The drawings were objected to under 37 CFR 1.83(a). The office action set forth the drawings did not show every feature of the invention specified in the claims and that the subject matter of claims 8 and 19 was not shown. As claims 8 and 19 were cancelled, Applicant believes this objection moot.

IV. The status of the US Applications listed in the specification (p. 8, lines 5-

8, lines 20-22, page 10, lines 17-20) was required to be updated. Applicant submits replacement paragraph above updating the status of the application to Patent No. 6,686,817.

V. The specification was objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following was required: The subject mater of claims 8 and 19 were not found to be disclosed in the specification. Applicant has cancelled claims 8 and 9 rendering this objection moot.

VI. The numbering of claims was not considered in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. The amendment to the claims above renumbered the claims 16 -22 as required.

VII. Claims 8 and 19 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. These claims have been cancelled.

Claims 3, 6, 8-22 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention in that claim 3, "the aperture" lacks antecedent basis and also confusing as to how "the aperture" is related to "an iris" recited in claim 1. It appears that "the aperture" and "an iris" refer to the same element. Claim 14 is also rejected for the same reason above. Claim 3 has been amended above to clarify that the aperture is inherent in an iris and set forth as such. Applicant submits that as aperture is used in claim 14, it is describing the features of the iris.

In claim 6, "said tunable varactors" lacks antecedent basis. Applicant has amended claim 6 as follows to have correct antecedent basis:

6. (Currently Amended) The voltage-controlled tunable filter of claim 1, wherein said at least one voltage tunable dielectric varactors includes a substrate having a low dielectric constant with planar surfaces.

Claims 8 and 19 could not be understood as to what are "the outer bias metallic contact", "the metallic electrode on the tunable dielectric." These claims have been cancelled.

The objection to claim 9 requires antecedent basis for "said tunable varactors" lacks antecedent basis. Claim 9 has been cancelled rendering the objection moot.

Claim 10 and 11 have been cancelled rending the objection to claim 10 and

11 lacking antecedent basis moot.

In claim 12, line 17, "said at least one coaxial combline resonator" lacks antecedent basis. Claim 12 has been amended as follows:

12. (Currently Amended) A method of using voltage to control a tunable filter, comprising the steps of:

providing a plurality of coaxial combline resonators;

said plurality of coaxial combline resonators include at least one metallized through-hole and an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

varying the capacitance of a capacitor by using at least one voltage tunable dielectric capacitor associated with said at least one coaxial combline resonator of said plurality of coaxial combline resonators; and

connecting said plurality of coaxial combline resonators with an iris.

In claim 13, "said at least one tunable varactor" lacks antecedent basis. Claim 13 has been amended as follows:

13. (Currently Amended) The method of using voltage to control a tunable filter of claim 12, further comprising the step of providing voltage to said at least one voltage tunable dielectric varactor with at least one

DC biasing point.

In claim 16, "said voltage-controlled tunable filter" lacks antecedent basis. In claim 20, "said tunable varactors" lacks antecedent basis. Claim 20 has been cancelled and claim 16 has been amended as follows traversing this rejection:

1416. (Currently Amended) The method of using voltage to control a tunable filter of claim 12, wherein said voltage-controlled tunable filter is a coaxial block voltage controlled tunable filter.

In claims 21 and 22, "said MEM tunable varactor" lacked antecedent basis. These claims have been cancelled rendering the objection moot.

CONCLUSION

It is respectfully submitted that, in view of the foregoing amendment and remarks, the application is in clear condition for allowance. The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. 1.16 or 1.17 to Deposit Account No. 502697. The Examiner is invited to contact the undersigned at 202-607-4607 to discuss any matter regarding this application.

Respectfully submitted,

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